"Treatment of long bone non---unions with Allomatrix"

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Objectives: This is the first Belgian study undertaken to look at reasons for post-traumatic amputation.
The aim of the study was to review all patients having undergone post-traumatic amputation of the lower limbs and find out if any of the amputations could have been avoided. It also aims to find out the reasons for post-traumatic amputation in the included patients.

Materials and Methods: This is a retrospective study of 51 patients having undergone amputation following lower limb injury. Of these 40 patients were included in the study. Patients were divided into three groups: immediate, intermediate and late amputation. The immediate amputation group contains 16 patients, intermediate 9 patients, late amputation 16 patients.

Results: In the early amputation group the procedure was chosen because of the gravity of the initial injury.
For the two other patient groups amputation was undertaken mainly for infection, musculo-cutaneos flap problems and pseudarthrosis.

Conclusion: Limb salvage patients undergo more surgical procedures than patients amputated early. The main long-term complications of high energy trauma to the lower limb are infection and pseudarthrosis.

11.53 Will I walk again? The challenge of rehabilitation in lower limb amputation

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Lower limb amputation is a major life event profoundly affecting the patient's psychological integrity and body image. A structured biopsychosocial and multidisciplinary approach is needed for the management of this condition.

Mr. D.B., a 59-year-old man with diabetes mellitus type II and a history of alcohol dependence, was admitted at the Emergency department for the necrosis of two toes and a phlyctena of the rightinstep. An ilio-femoral arterial bypass had been performed one year earlier. Computerized tomography showed an advanced gangrene of the foot and a right-sided below-the-knee amputation (BKA) combined with a fasciotomy was carried out.

An intensive rehabilitation program was started after amputation, but initially the patient demonstrated a negative attitude with help-rejecting behavior. The comprehensive and holistic approach of the multidisciplinary team led the patient to gain in motivation and autonomy. Upon discharge of the rehabilitation unit, the patient walked with an adapted BKA prosthesis and reintegrated his everyday live.

Amputation can be a devastating event which is difficult to manage for the patient and for the care team. The immediate postoperative psychological coping behavior is variable. Depression and anxiety are the most frequent psychiatric complications which may be aggravated by residual pain. Treatment after amputation involves a multidisciplinary rehabilitation regimen including pain management and psychological support to improve the patient's quality of life.

Auditorium Albert

12.05-13.00 Short oral presentation of posters

12.05 P1 Treatment of long bone non-unions with Allomatrix

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Objectives: We wonder if Demineralised bone matrix (DBM) (AllomatrixR) is able to promote healing without autografting procedure in the treatment of long bone non-unions.
Material and methods: 36 long bone non unions treated with DBM were retrospectively reviewed. Previous surgical treatment was performed more than 6 months before DBM implantation. Injectable DBM was placed percutaneously in 12 cases and with a surgical exposure in 24, associated with a new plate osteosynthese in 8 cases. Union was considered when no new surgical procedure has to be done and when fusion can be observed on at least 3 corticals with x-rays or scanner by two independent observers, one surgeon and one radiologist.
Results: 21 patients (59%) healed within a mean delay of 9.5 months. 2 patients had aseptic flow the first days after percutaneous implantation but without other complication. 3 infections (8%) and 4 hardware failures needed further surgical procedures and were therefore considered as failures. Persistent non union was noted in the remaining 8 patients at the last follow up. Percutaneous DBM implantation was associated with higher failure rate ($p<0.01$).

Conclusions: the result obtained in these series did not reach the level expected with an autograft or with recombinant bone morphogenetic proteins (rh-BMP). A high rate of failure was observed in percutaneous implantation, when the procedure did not allow debridement of the non-union. Poor contact was reported to correlate negatively with union. Though we did not find a correlation between co-morbidities, previous infection or infection occurrence, these have been reported by other authors. Variations in growth factors concentration for each DBM batch without osteoinductive assessment of the product and potential negative effect of sterilization method represent potential limitations to their use and these aspects should be addressed by tissue providers.

12.09 P2 The RIA harvesting system; higher than expected peri-operative morbidity?

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Objective: In the treatment of non-union fractures in long shaft bones the use of autologous spongiosa has been shown to be the superior treatment in comparison to demineralized bone and therefore remains the golden standard. Spongiosa harvesting can be performed from different locations as the iliac crest, proximal tibia or intramedullary from femur or tibia. The latter proved to be a good alternative especially if larger volumes of autologous bone are necessary. Previous research concluded that the donor site morbidity is lower and clinical outcomes are better in using the RIA system than the iliac crest. However the per operative morbidity in intramedullary harvesting of spongiosa is relatively unknown. Therefore the objective of this study is to obtain an overview of peri-operative clinical outcomes whilst using the 'Reamer-Irrigator-Aspirator' (RIA) - system for obtaining intramedullary spongiosa.
Material and methods: We performed a retrospective descriptive study on the period of May 2011 until September 2014 of patients who underwent reconstructive bone surgery in the VU medical center Amsterdam whilst using the RIA system in order to obtain intramedullary spongiosa. We evaluated multiple peri-operative parameters in order to obtain an overview of the status of the patient during the operation.

Results: We included a total of 19 patients. 16 male and 3 female with a median age of 48 years (range 22-76). One patient underwent two RIA procedures in the aforementioned period. The operation indication was non-union (77,7%), osteomyelitis (5.6%) or traumatic loss of bone (16.7%). The average bloodloss during operation was 556 cc (range 150 to 1400cc). This concurred with a haemoglobin drop per-operatively of 2.33 mmol/L (range 0 – 5.5) and hematocrit drop of 0.09 l/l (range 0 – 0.17). In one patient the cell saver was used and return administration of 722cc of red blood cells was performed. All other patients did not receive any blood transfusion peri-operatively. No fractures were seen on the donor long bone site. Donorsite wound infection did not occur, in the recipient localisation wound infection occurred in two cases. There were no further intra-operative complications. The average number of days of admittance in this treatment group was 8.8 days.

Conclusions: The usage of the RIA system appears to be a safe way to obtain intramedullary spongiosa. There were no per-operative complications in this case serie. Moreover there appears to be in general ample need for blood-transfusion in this group and the Hb drop peri-operatively is limited.

12.12 P3 Long term follow-up and PROMS of patients with a medial clavicle fracture

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Objectives: Clavicle fractures are a common fracture and often occur in younger individuals and elderly patients. Most of these fractures occur in the middle third and are treated non-operatively. The fractures in the medial part are less frequent and are believed to have a higher rate of non-union just like the lateral clavicle fracture and might require operative treatment. The goal of the study is to evaluate the long-term (> 2 years) patient reported outcome measures in patients with a medial third clavicle fracture.

Material and methods: 534 patients were included from January 2007 to July 2012. Patients characteristics were retrieved from our trauma registry and hospital information system. Clinical results were assessed with the DASH, and a demographic questionnaire. Plain radiographs were reviewed and scored. The data were analyzed with IBM® SPSS® Statistics 20.

Results: Eleven medial clavicle fractures (2.1%) in 7 male and 4 females. Traffic accidents where the cause of injury in 5 patients followed by fall from height in 3 patients. Right sided fracture in 4 patients. A multi fragment fracture was present in 2 cases, there were no open fractures. There were two delayed unions. None of the fractures were operated upon. The cosmetic result was experienced as reasonable till good. Pain during